What is Claimed:

1. A method of generating a dithered laser light with substantially constant amplitude in a system including a laser and a semiconductor optical amplifier (SOA), comprising the steps of:

a) amplitude modulating a laser drive current of the laser to generate a modulated laser light with optical linewidth dithering;

b) coupling the modulated laser light into the SOA; and

c) modulating an SOA drive current of the SOA approximately 180° out of phase with the laser drive current to generate the dithered laser light with substantially constant amplitude.

2. The method according to claim 1 wherein step (c) includes the steps of:

c1) setting a phase of a modulation of the SOA drive current 180° out of phase with the laser drive current;

c2) detecting an amplitude of the dithered laser light; and

c3) adjusting in phase at least one of the modulation of the laser drive current and the modulation of the SOA drive current until an amplitude of the dithered laser light is substantially constant.

3. An optical source to provide substantially constant amplitude, dithered laser light, comprising;

a laser source;

a semiconductor optical amplifier (SOA) optically coupled to the laser source;

a current modulator electrically coupled to the laser source to provide a first modulated drive current to the laser source; and

a phase shifter electrically coupled to the current modulator and to the SOA, the phase shifter shifting a first modulated drive current phase of the first modulated drive current to create a second modulated drive current, and the phase shifter providing the second modulated drive current to the SOA.

4. The optical source according to claim 3, wherein the phase shifter inverts the first modulated drive current in phase to generate the second modulated drive current.

5. The optical source according to claim 3, wherein the phase shifter shifts the first modulated drive current phase of the first modulated drive current approximately 180° to create the second modulated drive current.

6. The optical source according to claim 3, wherein the laser source and the SOA are monolithically integrated.

7. The optical source according to claim 3, wherein the phase shifter amplifies the second modulated drive current before providing the second modulated drive current to the SOA.

8. The optical source according to claim 3, wherein the phase shifter attenuates the second modulated drive current before providing the second modulated drive current to the SOA.

9. The optical source according to claim 3, further comprising an electroabsorption modulator (EAM) optically coupled to the SOA.

10. The optical source according to claim 9, wherein the EAM and the SOA are monolithically integrated.

11. A method of generating a dithered laser light with substantially constant amplitude in a system including a laser and a variable optical attenuator (VOA), comprising the steps of:

a) modulating a laser drive current of the laser to generate a modulated laser light with optical linewidth dithering;

b) coupling the modulated laser light into the VOA; and

c) modulating a VOA drive current of the VOA approximately in phase with the laser drive current to generate the dithered laser light with substantially constant amplitude.

12. The method according to claim 11 wherein step (c) includes the steps of:

c1) setting a phase of a modulation of the VOA drive current in phase with the laser drive current;

c2) detecting an amplitude of the dithered laser light; and

c3) adjusting at least one of the phase and an amplitude of the modulation of the VOA drive current until an amplitude of the dithered laser light is substantially constant.

13. An optical source to provide substantially constant amplitude, dithered laser light, comprising;

a laser source;

a variable optical attenuator (VOA) optically coupled to the laser source; and

a current modulator electrically coupled to the laser source and the VOA to provide a drive current modulation to the laser source and the VOA.

14. The optical source according to claim 13, wherein the current modulator amplifies the drive current modulation before providing the drive current modulation to the laser source.

15. The optical source according to claim 13, wherein the current modulator amplifies the drive current modulation before providing the drive current modulation to the VOA.

16. An optical transmitter which uses substantially constant amplitude, dithered laser light, comprising;

a laser source;

an electroabsorption modulator (EAM) optically coupled to the laser source;

a current modulator electrically coupled to the laser source and the EAM to provide a drive current modulation having a first frequency to the laser source and the EAM; and

a signal generator electrically coupled to the EAM to provide a signal modulation for modulating an optical signal of the optical transmitter at a second frequency significantly greater than the first frequency.